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Seeley on the Fossil Reptiles : II. Pareiasaurus ; VI. The Anomodontia and their Allies ; VII. Further Observations on Pariasaurus.³—Professor H. G. Seeley has again made the scientific world his debtors by his descriptions of new forms of South African fossil reptiles ; by his extensive comparisons of the characters of these, the oldest known members of the class ; and by his very full study of that remarkable form, the *Pariasaurus* of Owen. These works are valuable to students of the Reptilia of corresponding age in other parts of the world, and especially to those of the American forms. The descriptions are elucidated by cuts and plates.

Prof. Seeley has shown that the genus *Pareiasaurus* is allied to the American *Diadectidæ*, and that it represents a distinct family of the same order, the *Cotylosauria*. His proposition of a new ordinal name, *Pariasauria*, is perhaps due to the fact that the original definition of the *Cotylosauria* was defective in one respect. The corrected definition was published later, and in the same year as the proposal of the new name by Dr. Seeley.

Several important points of both anatomy and taxonomy are presented in these memoirs, on which I propose to touch. In the first place, no one had, at the time that these memoirs were written, distinguished between roof-bones and the bones of the brain case, in the Reptilia. Although the two series are to be entirely distinguished in all vertebrates which possess them, the same names have been used variously for opposite or adjacent elements of both. The names squamosal, epiotic and opisthotic have thus been used in double senses. For the posterior bones of the temporal roof I have adopted the terms zygomatic, supratemporal, supramastoid⁴ and tabulare.⁵ The supratemporal is called squamosal by Seeley. But the squamosal is a bone of the lateral wall of the brain case, and cannot be identified with any one of the three possible post-orbital bars of the Reptilia, which may be composed posteriorly of either the zygomatic, supratemporal or supramastoid. The epiotic of Seeley and of some others is the tabulare m., and has nothing to do with the original epiotic of Huxley.

Prof. Seeley describes the *Placodontia* as possessing two occipital condyles, which have the position of zygapophysial articulations. The basioccipital he describes as presenting "a thin film of bone" posteriorly on the middle line. Perhaps the basioccipital bone with its con-

³ From the *Philosoph. Transac. Royal Society of London*, 1888, p. 59 ; 1889, p. 215, and 1892, p. 311. Illustrated.

⁴ *Transac. Amer. Philosoph. Soc.*, 1892, 11.

⁵ *Proceeds. Amer. Philosoph. Soc.*, 1894, 110.

dyle is caducous, as it is in the *Diadectidæ*, and has been lost from the specimens Dr. Seely has examined. It is this peculiarity that led me into error in my first diagnosis of the *Cotylosauria*.

Prof. Seeley makes quite full comparisons with the forms of the American Permian. He seems impressed with reptilian affinities in *Eryops*. But this genus is a true *Stegocephal* in every respect, and has no greater affinity with the *Cotylosauria* than any other member of the order. In quoting my description of the tarsus of the *Clepsydropidæ*, he falls into error in stating that I allege that "the tibials and centrals united to form an astragalus." I have stated that the intermediate and centrals unite to form the astragalus. He also states that I have not figured the intercentra of the *Pelycosauria*. He will find that my figures of *Clepsydrops* and *Dimetrodon* represent them.

Dr. Seeley shows that the structure of the vertebral column and pelvic arch have a close similarity in the *Cotylosauria*, *Anomodontia* and *Theriodonta* of South Africa. I have discovered the same characters of these regions in the *Cotylosauria* and *Pelycosauria* of North America. For the order which is to include these divisions, Seeley, like Lydekker, retains the name of *Anomodontia* of Owen. But Owen originally proposed this name for the group which includes the genera *Oudenodon*, *Dicynodon* and *Lystrosaurus* (*Ptychognathus* Owen). Further, in his work of 1876⁶ on these reptiles, he continued this use of the name, making it of equal rank with the *Theriodonta*. It being evident that the entire division required a name, I gave it that of *Theromorpha* (*Proceed. Amer. Philosoph. Soc.*, 1880, p. 38); (subsequently altered to *Theromora*, on account of preoccupation.) The use of the name *Anomodontia* for this order has no support in the rules of nomenclature.

Dr. Seeley discusses the possible relation of the *Pelycosauria* of the American beds with the African *Theriodonta*. There are important resemblances between these groups. Unfortunately, corresponding parts of the two are in several cases unknown. Thus the shoulder girdle and tarsus of the *Theriodonta* have not been yet obtained. Until these lacunæ are made good we cannot determine the mutual affinities of the two. We naturally look to Prof. Seeley for more light on this subject. It is possible, also, as I have suggested, that the postorbital arch of the *Theriodonta* is the superior arch (supratemporal), and not the inferior arch (zygomatic), as in the *Pelycosauria*.

NOTE.—In my paper on the Plesiosaurian skull (*Proceeds. Amer. Philos. Soc.*, 1894, p. 111, line 10), by a lapsus calami, I wrote *Proterosauria* for

⁶ Description of the Fossil Reptilia of South Africa in the British Museum.

Procolophonina. In my paper on the postorbital bars of Reptilia (Trans. Amer. Philos. Soc., 1892, p. 16, bottom) I refer to the postorbital bar of the Theriodonta, meaning the Pelycosauria. This is due to the premature assumption by English authors, to which I at the moment assented, that the two groups are identical.—E. D. COPE.

Scott on the Mammalia of the Deep River Beds.⁷—In this handsome memoir of 130 pages we have recorded the results of the Princeton College expedition of 1891. The region explored is the valley of Deep River, one of the upper tributaries of the Missouri in Montana. This formation was observed to contain fossils by Grinnell and Dana in 1875, and was explored by a party sent by the present reviewer in 1878. The latter reported from it twelve species of Mammalia all of which were new except a *Prothippus* of Loup Fork age, and a *Protolabis* of uncertain species. The Princeton expedition obtained twenty-two species, of which eight are new to science. Prof. Scott prefers to call this formation by the name of Deep River, rather than the *Ticholeptus* bed, as it was originally named by Cope. This is because the name *Ticholeptus*, as a paleontological term, is a synonym of *Merychys*. However, as applied to a formation, it was not preoccupied, and it is doubtful whether, under the rules, it can be changed.

The new forms belong to the following orders: Carnivora, 2; Glires, 1; Perissodactyla, 2. Artiodactyla, 3. The most important addition to the Carnivora is a new genus of Canidæ, *Desmatocyon*, which agrees with *Canis*, except in the possession of three longitudinal convolutions of the cerebral hemispheres. The Glires are represented by a new *Steneofiber*. The most important novelties are two species of three-toed horses, which are named respectively *Desmatippus crenidens* and *Anchitherium equinum*, the latter the largest known American species of its genus. Prof. Scott takes occasion to present a new classification of the genera of American three-toed horses, distinguishing four genera in species formerly referred to *Anchitherium*. These are *Meshippus*, *Miohippus*, *Desmatippus* (nov.) and *Anchitherium*. Scott has already shown that *Meshippus* differs from the other genera in the absence of pits of the incisors, and he assumes that *Miohippus*, named but not distinguished by Marsh, possesses those pits, although he states that its upper incisors are not known. I can state that this supposition is perfectly correct, as they are present in the species I have called *Anchi-*

⁷ From the Transactions of the American Philosophical Society, 1894, Vol. XVII, p. 55.